DOCUMENT RESUME

ED 397 130 TM 025 290

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TITLE The Unfolding Matrix: A Dialogical Technique for Qualitative Data Acquisition and Analysis.
PUB DATE Apr 96
NOTE 30p.; Paper presented at the Annual Meeting of the American Educational Research Association (New York, NY, April 8-12, 1996).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; *Academic Persistence; College Students; Data Analysis; Ethnic Groups; Higher Education; Knowledge Level; *Matrices; *Minority Groups; *Qualitative Research; *Research Methodology; *School Holding Power; Social Support Groups
IDENTIFIERS *Dialogic Communication

ABSTRACT

Most of the literature on student retention focuses on what students do "wrong" that leads to departure from college, but there is much to be learned from studying student success in higher education. This article presents a study designed to uncover the strategies that successful minority students employ to overcome barriers to academic success by using an innovative technique that assesses the informal knowledge required to achieve success in higher education. Each study began with an empty data matrix that was gradually filled as data were collected. The filled matrix then became a qualitative data set that was used to become a concept model for understanding the phenomenon under study. Three groups of 5 to 10 academically successful ethnic minority students each completed the matrix. Analysis of the data indicated that students faced barriers related to the continuity between high school and college, prejudice, and lack of resources. Successful minority students overcame barriers by creating a supportive "family" on campus or by involving their biological families in the collegiate experience, participating in ethnic activities, seeking out nurturing persons, and using institutional resources. Findings are discussed in the context of the expertise model of success and a local model of heuristic knowledge associated with this specific campus. (Contains 8 figures and 16 references.) (Author/SLD)

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The Unfolding Matrix: A Dialogical Technique for Qualitative Data Acquisition and Analysis

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Abstract

Most of the literature on student retention focuses on what students do "wrong" that leads to departure from college. There is much to be learned from studying student success in higher education. This article presents a study designed to uncover the strategies that successful minority students employ to overcome barriers to academic success by using an innovative technique that assesses the informal knowledge required to achieve success in higher education.

The Unfolding Matrix: A Dialogical Technique for Qualitative Data Acquisition and Analysis

Introduction

The retention of ethnic minority college students continues to be an important concern in American higher education. More than a decade ago, the National Longitudinal Study (NLS) and Current Population Surveys (CPS) estimated that only 42 percent of African American students, 31 percent of Hispanic students, and 39 percent of American Indian students completed college (Astin, 1982). More recent data show a similar pattern with persistence or degree completion rates estimated at 40 percent for African American students and about 47 percent for Hispanic students who had entered college six years earlier (Tinto, 1993); for American Indian students the estimated degree completion rate was 25 percent over four years (Wells, 1989). Clearly, too many minority students continue to leave colleges and universities before completing a degree. This lack of degree attainment poses a serious challenge for many post secondary institutions, particularly in light of current demographic data which indicate the presence of large numbers of minority students in the U. S. population.

For several decades, researchers have been attempting to study the dynamics of students leaving college. Many factors have been identified with institutional departure, some related to the students themselves and others to institutional policies and practices. However, despite the significant volume of research on retention that spans several decades (Tinto, 1993), the impact of this research on improvement in retention rates has been less than desired. As indicated above, colleges and universities continue to lose large numbers of students, particularly minority students. Moreover, most of the existing research on student retention and persistence considers these topics from the perspective of student non-success and failure. Attrition, withdrawal, dropouts, pushouts, and institutional departure

are only a few terms with negative connotations that have been used by researchers to describe and assess student behavior associated with leaving college (Nielsen, 1986; Tinto, 1993). Researchers have tried to determine what it is that students do "wrong" that leads to institutional departure. There is very little research that examines the issue positively (e.g., from the angle of successful students). Yet, there is much to be learned from studying what it is that students do "right" that leads to graduation from college. Examining student success in college represents a fresh perspective on student retention; it also opens new ways of thinking and possibilities for the development of theoretical models of success that can lead to practical strategies for retaining students. The research presented here is one example of studying student retention issues from the perspective of successful students.

Purpose of the Study

The study presented here focuses on successful minority students. Specifically, the objective of the study was to use the expertise model of successful college students (Padilla, 1991, 1994) to develop a local model of successful ethnic minority students at a large research university in the Southwest. Consistent with the expertise model of successful students, the researchers sought to identify the campus specific heuristic knowledge and actions that successful minority students employ to overcome barriers to academic success.

The Expertise Model of Successful Students

Padilla (1991) developed a model of successful college students which focuses on the knowledge that such students possess and the actions that they employ to overcome barriers. As shown in Figure 1, the expertise model, which is based on the results of qualitative research and expert systems theory, suggests that successful

college students are those students who are in effect "experts" at being successful as students at a specific college or university. Consistent with expert systems theory, expertise is viewed as compiled knowledge which comprises two key components: theoretical and heuristic knowledge (Harmon & King, 1985). Theoretical knowledge is largely book knowledge that is learned on campus through course work and formal study, while heuristic knowledge is locally defined and acquired experientially. All students arrive on campus with a given level of theoretical as well as heuristic knowledge. Upon arrival on campus and throughout their tenure as students, they are challenged by the institution to demonstrate increasing levels of theoretical knowledge before they can be awarded a degree. Such knowledge is typically acquired through courses and demonstrated through tests or other formal assessment procedures. This aspect of college going is well understood conventionally. However, the expertise model also suggests that students must acquire a certain amount of heuristic or practical knowledge that is necessary in order for the students to function competently on campus. For example, knowing when to drop a course rather than fail it is an important bit of heuristic knowledge. Similarly, knowing when to change majors may make the difference between earning a degree and not persisting to graduation. Or, in the case of financial aid, monitoring key deadlines by marking dates on a calendar is important knowledge for obtaining the funds to continue in college.

[Place Figure 1 about here.]

As it turns out, heuristic knowledge is not usually taught to students in a formal manner, nor is it significantly generalizable from one campus to another. Commonly, heuristic knowledge is passed informally by students with experience to new students on a one-to-one basis or by student organizations in groups. Overall, the acquisition of heuristic knowledge is not systematic and therefore does not reach

many students in a coherent manner. Yet, students are required to amass a substantial body of heuristic knowledge early in their college careers and continuing throughout their college years. Those who fail to do so are not likely to succeed to degree completion. Current research shows that about sixty percent of all students who leave college do so during their freshman year (Tinto, 1993). This underscores the importance of attending to heuristic knowledge concerns as soon as the students arrive on campus, if not before. Key to the successful application of the expertise model is the assessment of heuristic knowledge both as an indicator of the barriers that students must overcome on a particular campus and as a means to identify the actual knowledge and actions that successful students utilize to overcome the barriers. The following section describes an appropriate procedure for assessing heuristic knowledge.

Assessment of Heuristic Knowledge

Consistent with the expertise model of successful students, Padilla (1991, 1994) developed a technique to assess the heuristic knowledge of successful college students. The "unfolding matrix" technique is rooted in earlier work by Glaser and Strauss (1967), Freire (1970), Spradley (1979), and Miles and Huberman (1984). The latter suggested a variety of display techniques for qualitative data, including matrices. However, the matrices recommended by Miles and Huberman are created after the data are collected and analyzed. Padilla (1994) suggested that researchers could use a matrix to collect data in the first place. Hence, each study begins with an empty matrix, which is gradually filled as data are collected. After data collection is completed, a filled matrix becomes a qualitative data set that is subjected to interpretive analysis to develop a concept model for understanding the phenomenon under study, in this case the success of college students on a particular campus.

One efficient analytic strategy is to start by developing a taxonomy of elements contained in the lead data vector (in this case the barriers data vector). After this taxonomy is developed, additional taxonomies can be developed from the elements in the other data vectors of the matrix. When taxonomies are developed for the non lead data vectors independently from the taxonomy created from the lead data vector, the resulting analysis of the matrix is considered to be non contingent. In contrast, a contingent analysis of the matrix restricts the taxonomies of the non lead data vectors by making them dependent on the taxonomy first created for the elements of the lead data vector.

When applied to the study of successful students in higher education, the unfolded matrix consists of a set number of data vectors (see Figure 2). The matrix starts out with the lead data vector and its cover term (Spradley, 1979). In this case the cover term is "barriers", which enfolds a collection of specific barriers that successful students encounter and overcome in colleges and universities. Once the collection of specific barriers is identified by the interviewees, the unfolding of the rest of the matrix entails extracting additional information related to each barrier concerning frequency of occurrence, knowledge needed to overcome the barriers, and the specific actions taken by successful students to overcome each barrier. Optionally, information also may be gathered regarding possible institutional changes than could be made to ameliorate or eliminate each barrier along with the likely problems that could result if the institutional changes were actually made.

[Place Figure 2 about here.]

Several aspects of the unfolding matrix technique are of particular importance. First, it is utilized within an "action research" perspective. Action research not only contributes to the knowledge base of the researcher, but also simultaneously and immediately imparts to the participants of the study some of

the heuristic knowledge that is possessed by successful students. This is consistent with the action research idea that the dissemination of information should take place as an integral part of the research process.

Second, the technique aims to identify the heuristic knowledge and actions of successful students. An effective way to achieve this objective is to assemble a group of students who will interactively and dialogically provide the needed data. Because students live, study, and work in a particular college or university, they are the "experts" who can identify the barriers, estimate their frequency of occurrence, outline the requisite knowledge and describe effective actions to overcome them, and identify the changes that can be undertaken by the institution to remove or diminish these barriers.

Third, the completion of the matrix (data gathering) takes place in groups, somewhat akin to focus groups. Tandem group interviews (Spradley, 1979) are used. The word "tandem" refers to the fact that several groups of respondents are used serially to fill a given matrix.

Fourth, the data collected in a completed matrix must be analyzed interpretively to tease out relationships and concepts. What is sought through such analysis is a local model of student success that is specific to the institution studied. Finally, it should be clear that theoretically the lead cover term and its subsumed elements can be unfolded into a virtually unlimited number of features, thus allowing for the possibility of developing a well elaborated local model of the situation under study.

Data Collection Procedures

Data collection was carried out using the unfolding matrix procedure described above, but only the barriers, knowledge, and actions data vectors were utilized. Three dialogical groups (5-10 students per group) completed the matrix.

Participants in the study were recruited from the general population of ethnic minority students at the focal university. Staff from across the campus (e.g., School of Engineering, Minority Student Affairs, School of Business, Student Government, American Indian Center) assisted with the recruitment of students for the study. There were two criteria for selecting students. First, the students were to be self-identified members of the Latino, African American, Asian, or American Indian student populations on campus. Second, the students had to be sophomores, juniors, or seniors. Freshmen students were not included in this study because they would not have the experience necessary to be able to generate the required data.

In recruiting student participants, staff and students were informed that the understanding of success would emerge from the groups. Thus, it was not necessary for students to have a high grade point average to participate in the study. In soliciting the data, each group was instructed to think about a successful student at the institution. A successful student could be taken as someone who had completed a degree or was making satisfactory progress to that end at the focal university. Such a student could include the subjects themselves, but not necessarily.

Tandem group interviews of students were conducted. Each group interview (consisting of five to ten students) lasted about one hour. Since no single group could fill a complete matrix in that amount of time, the initial group started the process and contributed as much data as it could. The next group started where the previous group ended and attempted to saturate particular data vectors. Both male and female African American, American Indian, Asian, and Latino students participated in the study.

A Local Model of Heuristic Knowledge

Analysis of the data in the completed matrix produced three grounded categories of barriers that successful minority students must overcome at the focal

campus (see Figure 3). The three categories of barriers were labeled as follows: (1) discontinuity barriers, (2) prejudice barriers, and (3) resource barriers. When this taxonomy of barriers is combined with contingent analyses of knowledge and actions data vectors, a local model of heuristic knowledge that is possessed by successful minority students at the focal university can be developed (see Figure 8).

[Place Figure 3 about here.]

Discontinuity Barriers

Discontinuity barriers (see Figure 4) include obstacles that hinder a student's smooth and continuous transition from high school to college. These barriers are overcome when students successfully adjust to a new, physically different, campus environment, balance and control independence from parents and high school teachers, and come to terms with the ramifications of choosing to pursue a college degree versus immediate employment and its concomitant rewards.

[Place Figure 4 about here.]

A contingent analysis of the knowledge vector suggests that successful minority students perceive discontinuity barriers in distinct ways. For example, successful minority students consider the college experience as different and challenging when compared to previous experiences. Students know that challenges related to college going are unavoidable and they protect themselves preemptively by deciding that it is worthwhile to face such challenges. Thus, it appears that successful minority students engage in some mental conditioning prior to their arrival on campus. Stated differently, these students develop an expectational stance. That is, they expect and anticipate that the overall college going experience will be different from high school and that various challenges will confront them. One challenge which they know to expect is that they will be an ethnic minority student on campus and that they will not receive the same

emotional support that they are accustomed to receiving in their home environment. They also determine that there is intrinsic and economic value to a higher education and that their efforts will pay off when they seek employment after college. The expectational stance of successful students is reinforced by specific action strategies associated with making their own decision, acting responsibly, and "shrinking" the social world of the university to make it more manageable and less overwhelming.

In addition to the expectational stance taken with respect to the discontinuity barriers, successful minority students also undertake specific actions to overcome discontinuity barriers. Effective actions translate into (1) building a support base by joining or creating clubs related to the student's ethnic background, (2) promoting independence by making their own decisions, sacrificing, and taking reasonable risks early in their college careers, and (3) acting as informed consumers by researching the profitability of their chosen major or career. The latter also entails favorably comparing self to others who are using their time and efforts differently by not attending college.

Prejudice Barriers

The second category of barriers confronted by successful minority students is prejudice. This category contains two subcategories which are labeled as *lack of nurturing* and *lack of minority presence* on campus. Barriers related to the lack of nurturing refer to the absence of supportive resources on the campus needed to facilitate the adjustment and development of minority students. Lack of presence, on the other hand, refers to barriers associated with the absence of minorities in the curriculum, university programs, and the general university population of students, staff, and faculty. In general, prejudice barriers refer to institutional

culture and practices that tend to marginalize, devalue, and omit ethnic minority students.

A contingent analysis of the knowledge vector (see Figure 5) suggests that successful ethnic minority students possess specific knowledge that empowers them to overcome prejudice barriers. They know that they must nurture themselves or acquire nurturing from others. Self-nurturing is accomplished by knowing their self-worth, depending on themselves, and being persistent about meeting their own needs. Nurturing from others includes accessing supportive groups (especially ethnic student organizations) and mentoring resources that may not necessarily be formally organized by the institution.

[Place Figure 5 about here.]

Specific actions taken by successful minority students to overcome the lack of nurturing barriers include creating a supportive "family" on campus or involving the student's biological family in the collegiate experience, participating in ethnic activities, seeking out nurturing persons, and utilizing institutional resources. Creating a campus family involves the construction of a fictive family that can be supportive of the student's endeavors. Relations with the fictive family are strengthened by participating in ethnic student organizations and attending ethnic events. Involving the consanguineous family, on the other hand, translates into keeping and generating the support of the biological family by involving parents in the student's education. Other actions by successful minority students lead them to nurturing persons outside their fictive and biological families, including any person or group without regard to ethnicity or employment status (e.g., special friend, faculty, staff person, or student). Finally, actions related to institutional resources result in assistance from faculty, tutors, and various other institutional support programs.

Actions related to overcoming barriers involving a lack of minority presence on campus are premised on first knowing that minority support is important (see Figure 6). Consequently, successful students ask about and seek out the ethnic presence that already exists on campus. Successful minority students also know about the importance of being culturally grounded in their own ethnicity and use this understanding as inoculation against the lack of a minority presence on campus. Strengthened by this knowledge, successful minority students participate and become active in ethnic student organizations, draw in people by making themselves known on campus, and develop their academic skills.

[Place Figure 6 about here.]

Resource Barriers

Resources is the final category of barriers that successful minority students must overcome. This category includes barriers related to lack of money and learning to deal with the financial aid system. To overcome these resource barriers (see Figure 7), successful minority students know that they must prepare early for the financial aid process, network with people who understand the financial aid system, and develop their time management skills. What they actually do is to plan early for the financial aid process, and perform well in their academic work in order to be eligible for scholarships.

[Place Figure 7 about here.]

In summary, the complete local concept model of successful minority students is shown in Figure 8. Successful minority students at the focal university must overcome three categories of barriers. They are: discontinuity, prejudice (manifested as a lack both of nurturing and a minority presence on campus), and resource barriers. As shown in the local model, there is a specific body of knowledge

and associated actions that successful minority students use to overcome the barriers to degree attainment.

[Place Figure 8 about here.]

Implications for Theory and Practice

The expertise model of student success (and its derivative local models) can be considered in a broader theoretical context that includes human development generally, and the field of higher education in particular. In addition, specific local models may be used to influence policy and practice in student retention efforts.

A central idea within human development is that people need a balance of support and challenge in order to develop and succeed in a particular environment. This idea is derived from the classic work of Adler (1963) that focuses on the relationship between parents and their children. He suggested that the "good parent" is one who provides both support and challenge in the raising of children. Support provides the secure base of love and safety embodied in the presence and actions of parents or other caregivers; challenge constitutes the new experiences and information provided to the child that enables learning and growth to occur. When provided with too much support and not enough challenge, the child fails to develop needed competencies and becomes overly dependent on others within his or her environment. On the other hand, when subjected to too much challenge and not enough support, the child may become overwhelmed with anxiety and fail to adequately integrate the new experiences. Thus, for children to develop properly in their early childhood environments, a balance of support and challenge is needed.

In the case of young adults within the context of higher education, support consists of those aspects of the human and material environment that provide

students with the security, sense of well-being, and information needed to succeed in college. Challenge includes encounters with new situations, people, and ideas that cause students to view the world and themselves differently, engendering their development and growth. Hence, student development is fostered when there is a balance of support and challenge within the students' college environment. Indeed, this notion of support and challenge applies to all students, ethnic minority or majority group members alike. However, the local model derived from the present study suggests that support and challenge manifest themselves differentially across students and college campuses.

For many majority group students, institutions of higher education provide the healthy balance required between support and challenge that leads to their academic and social development. For example, there is often greater cultural continuity between the home and college environment that provides them with a sense of familiarity and security. Likewise, there is a stronger likelihood that others in their family will have previously attended college and can help them smooth their transition to college. Additionally, it is more likely that majority students will have older or experienced students, professors, staff, and administrators of the same ethnicity who can serve as role models. Finally, more of society's resources are provided to majority students at the high school level in their pre-college academic preparation. Thus, there is an abundance of supports built into the university and the larger society for many majority students so that they may successfully confront the many challenges of college life.

In contrast, the local model of successful ethnic minority students suggests that the same degree of support may be absent for these types of students. The students who participated in the study indicated, for example, that they perceive the existence of little cultural continuity between home and school. They indicated,

furthermore, that few or no members of their families attended college before them to help them know what to expect, few role models of the same ethnicity are present within their college environment, and fewer resources were invested in their pre-college training.

Given these observations, it is suggested that, while confronting some of the same campus challenges that majority students face, ethnic minority students are provided with fewer supports needed for their successful integration into college. Moreover, the results indicate that successful minority students are those who learn how to get the support they need within their particular campus environment. The participants described successful students as those who were able to nurture themselves, seek out supportive others, acquire needed skills and information, and create a familiar niche on campus so that they could capably address the challenges at the university. Stated differently, they created for themselves the personal and environmental supports that were lacking institutionally in order to confront effectively the challenges of college.

Turning to the field of higher education, the expertise model, along with the local model of successful minority students developed through this study, converge with, as well as diverge from, the predominant thought on student retention that is based on Tinto's (1993) model of student withdrawal from college. At the heart of Tinto's model, with roots in Durkheim's (1951) theory of suicide, is the idea that students must be well integrated academically and socially into campus life if they are to be successful in college. The local model that emerged in the present study is consistent with this central aspect of Tinto's theory and, moreover, provides a wealth of ideas and strategies regarding what students can do to become involved in the academic and social life of their campus. The results indicate, for example, that

successful minority students join or establish ethnic organizations, create a supportive "family" on campus, and develop their academic skills.

Despite this key area of convergence with Tinto's model of student departure, the local model of successful minority students differs in significant ways from Tinto's perspective on the student collegiate experience. To emphasize, Tinto focuses on the individual and institutional factors that lead to student withdrawal from college so that his model is properly one of student departure. In contrast, the expertise model of student success, and its specific expression in local models of successful students, emphasizes student retention and the individual and institutional factors that result in graduation from college. This difference is critical because the focus on student success may open new ways of understanding student retention and possible strategies to increase graduation rates. Furthermore, as indicated by Tinto, "There is little evidence to suggest that departure is simply the absence of persistence or that one can be understood solely as a mirror image of the other" (1993, p. 91).

Moreover, Tinto's theory of student departure incorporates some elements from Van Gennep's (1960) framework for understanding the rites of passage in tribal societies and uses them to account for the process experienced by students as they become integrated into college. In brief, Van Gennep found that integration involves three distinct stages: separation from past associations, a period of transition or temporary normlessness, and incorporation into the new group. Taken together, these stages represent the separation from the old group so that incorporation into the new group can occur.

The local model of successful minority students that emerged from the present investigation departs significantly from Van Gennep's (1960) framework. The results suggest that ethnic minority students, rather than experiencing the

transition to college as one of separation from their home community as a step in becoming integrated with the academic campus community, instead attempt to incorporate their cultural community into the campus community as a means to achieve success in college. Thus, while the majority students may emphasize separation from their home community in transitioning to college, minority students appear to emphasize continuity with their home community. Numerous examples of this phenomenon are found within the data, including the emphasis on knowing about and joining ethnic organizations, participating in ethnic activities, and generally seeking out the ethnic presence that exists on campus as a means of being culturally grounded. Rather than separate themselves from past cultural associations, ethnic minority students strive to retain and nurture a sense of ethnic identity while on campus. This is consistent with research which suggests that many ethnic and racial minority students adhere to a collectivist orientation (commitment to the group) rather than to an exclusively individual orientation (commitment to self) (Espinoza & Garza, 1985; Treviño, 1992).

Similarities and differences also are found between the present work and Tinto's views on evaluation. Tinto argues that retention efforts, and the evaluation of these efforts, must be conducted on an institution-by-institution basis and must be student centered. The expertise model utilized in this study is not only consistent with this view, but also provides a qualitative method for assessing the heuristic knowledge configuration of particular institutions.

However, there is a key difference in focus. Tinto's focus is almost exclusively on institutional evaluation and change. He assesses the institution's impact on the student 's experience in order to identify institutional modifications that could lead to increased student retention. The expertise model used here agrees with the need to evaluate and make changes at the institutional level. But it does so

by eliciting an emic perspective to identify institutional changes that may serve to eliminate or minimize barriers to success within a college or university. Moreover, in addition to supporting change at the institutional level, the expertise model, through its local instantiations, provides a means for empowering individual students to overcome existing barriers within their own campus environment. Hence, the students are helped whether or not the institution changes its practices.

In addition to implications for theory, the expertise model of successful students also has practical significance. As already noted, application of the expertise model results in local models of successful students in particular institutions. Thus, researchers are able to characterize the nature of student success at a single institution at a given time frame. Because they speak directly to the local situation, local models of success have more direct application than normatively based models that attempt to improve practice on the basis of findings abstracted from many campuses, often of quite divergent character.

A local model identifies the heuristic knowledge associated with successful degree completion on a specific campus. Embedded within this heuristic knowledge is very practical information and strategies that successful students implement for achieving success in college. Once captured, this knowledge can be easily disseminated to both entering and continuing students in the form of booklets, videos, orientation presentations, college "survival" courses, and student organizations. With appropriate data collection, local models also can produce information that has implications for institutional change. This information can be used to diminish or eliminate specific barriers to students' academic success.

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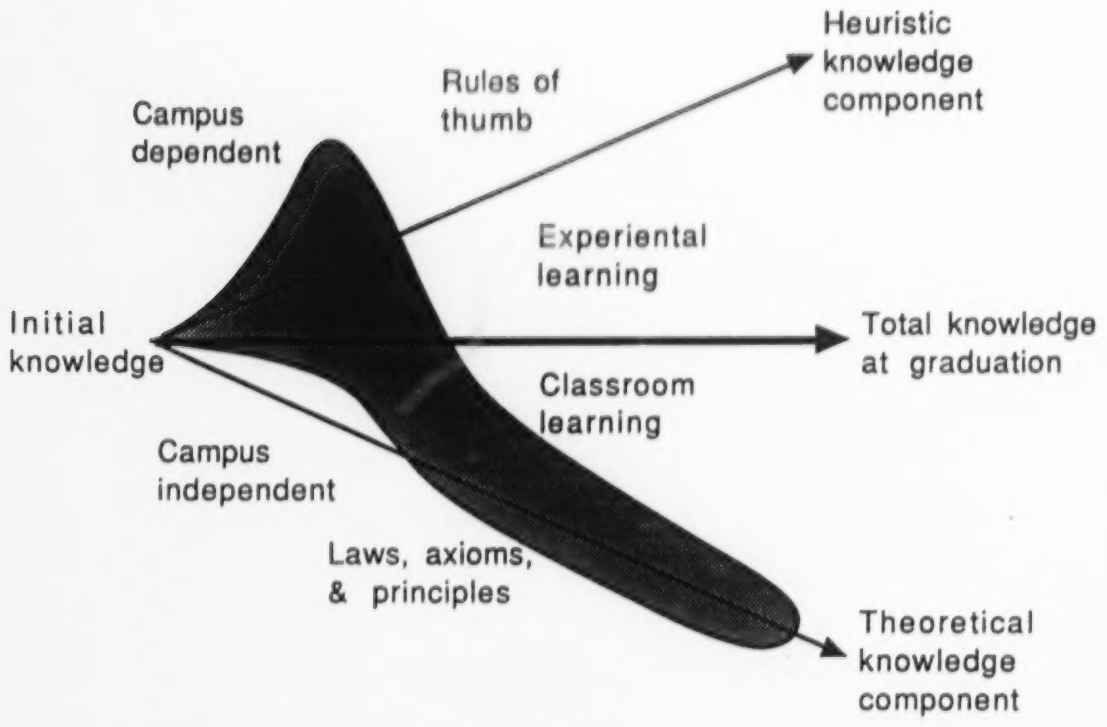

Figure 1. Expertise model of successful college students. Degree attainment requires the acquisition of both theoretical (formal) knowledge and heuristic (campus specific) knowledge. The shaded area shows the hypothesized distribution of each type of knowledge. Heuristic knoweldge must be acquired early in the college career. Source: Adapted from Padilla, 1991.

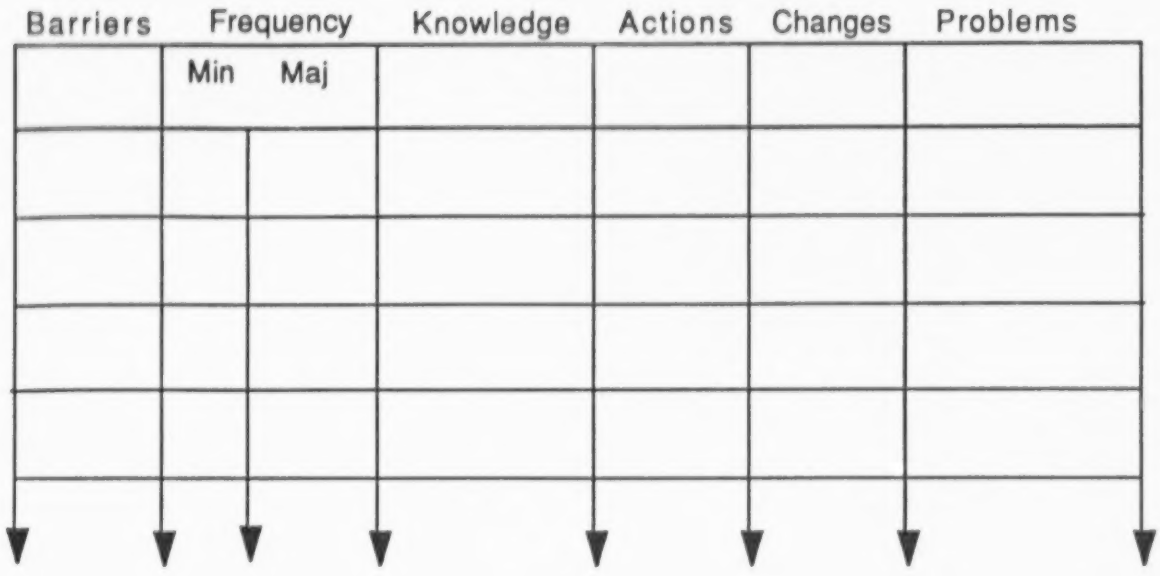

Figure 2. Unfolded matrix for assessing the heuristic knowledge of successful college students. Note the data vectors for frequency, institutional changes, and problems which were not used in the present study. Source: Padilla, 1994.

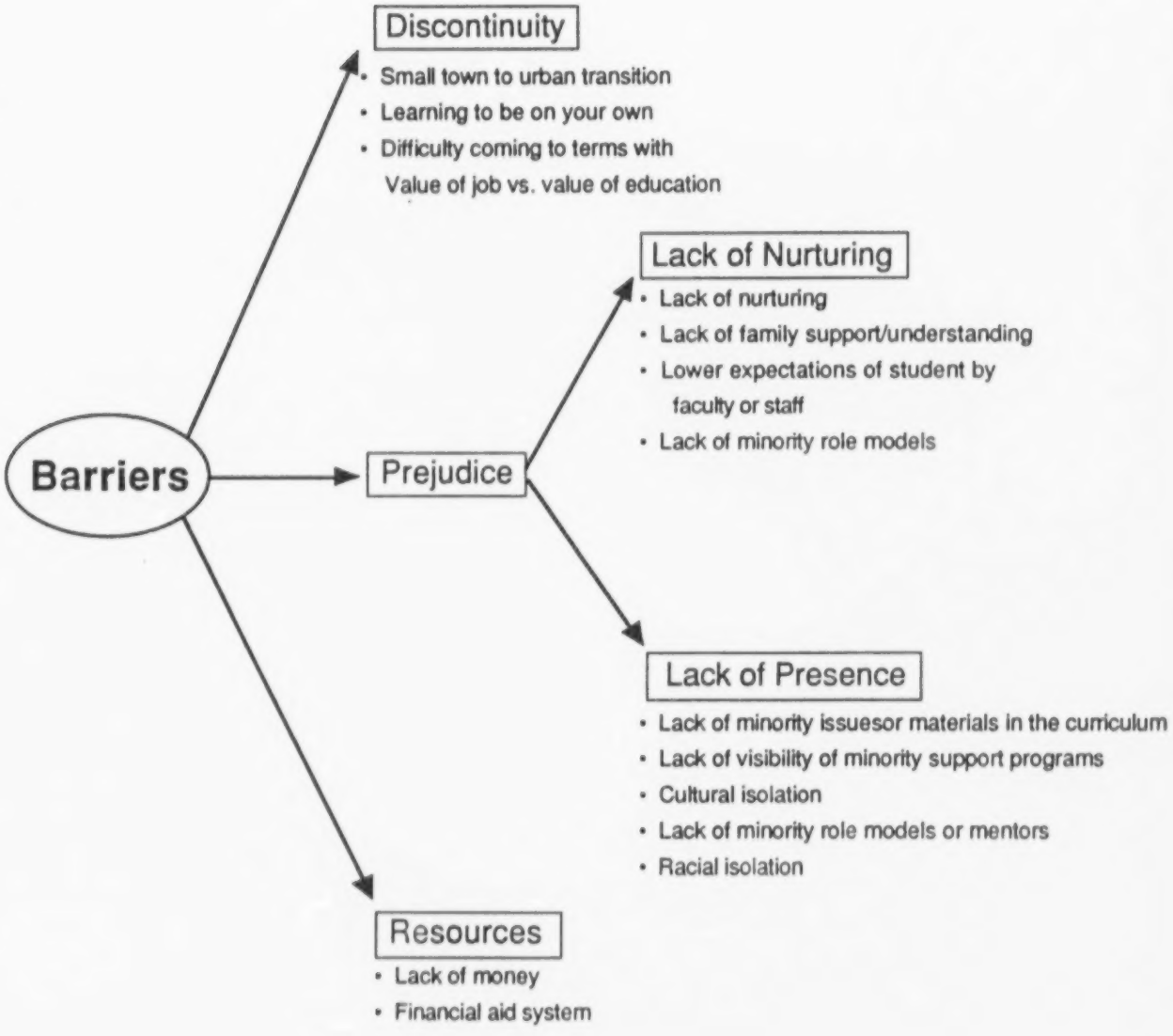
Barriers
Discontinuity
• Small town to urban transition
• Learning to be on your own
• Difficulty coming to terms with
Value of job vs. value of education
Prejudice
Lack of Nurturing
• Lack of nurturing
• Lack of family support/understanding
• Lower expectations of student by
faculty or staff
• Lack of minority role models
Lack of Presence
• Lack of minority issuesor materials in the curriculum
• Lack of visibility of minority support programs
• Cultural isolation
• Lack of minority role models or mentors
• Racial isolation
Resources
• Lack of money
• Financial aid system

Figure 3. Taxonomy of barriers that successful students must overcome at a large public university in the Southwest from the perspective of ethnic minority students.

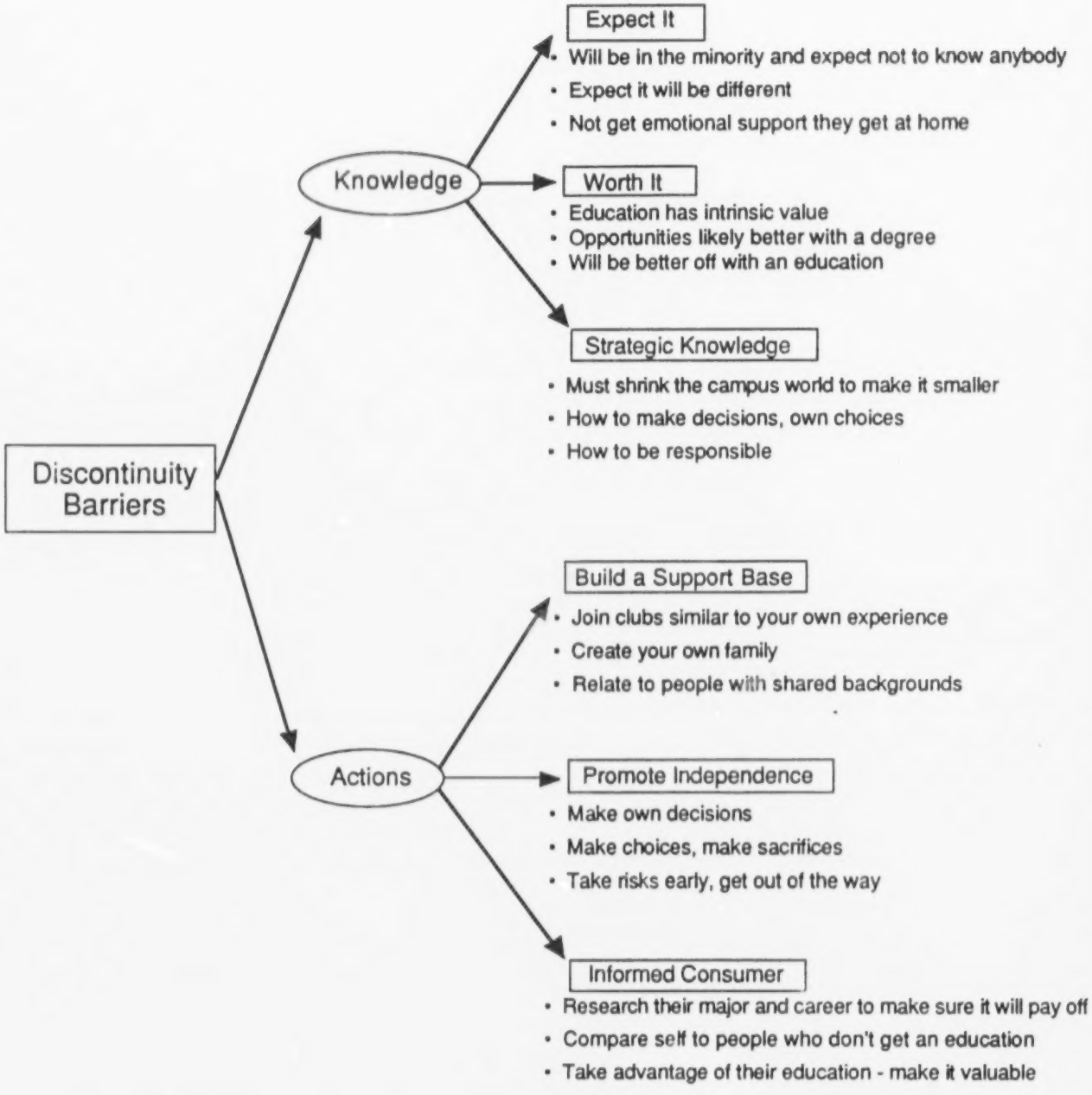
Discontinuity Barriers
Knowledge
Actions
Expect It
• Will be in the minority and expect not to know anybody
• Expect it will be different
• Not get emotional support they get at home
Worth It
• Education has intrinsic value
• Opportunities likely better with a degree
• Will be better off with an education
Strategic Knowledge
• Must shrink the campus world to make it smaller
• How to make decisions, own choices
• How to be responsible
Build a Support Base
• Join clubs similar to your own experience
• Create your own family
• Relate to people with shared backgrounds
Promote Independence
• Make own decisions
• Make choices, make sacrifices
• Take risks early, get out of the way
Informed Consumer
• Research their major and career to make sure it will pay off
• Compare self to people who don't get an education
• Take advantage of their education - make it valuable

Figure 4. The knowledge and actions that successful students use to overcome discontinuity barriers from the perspective of minority students.

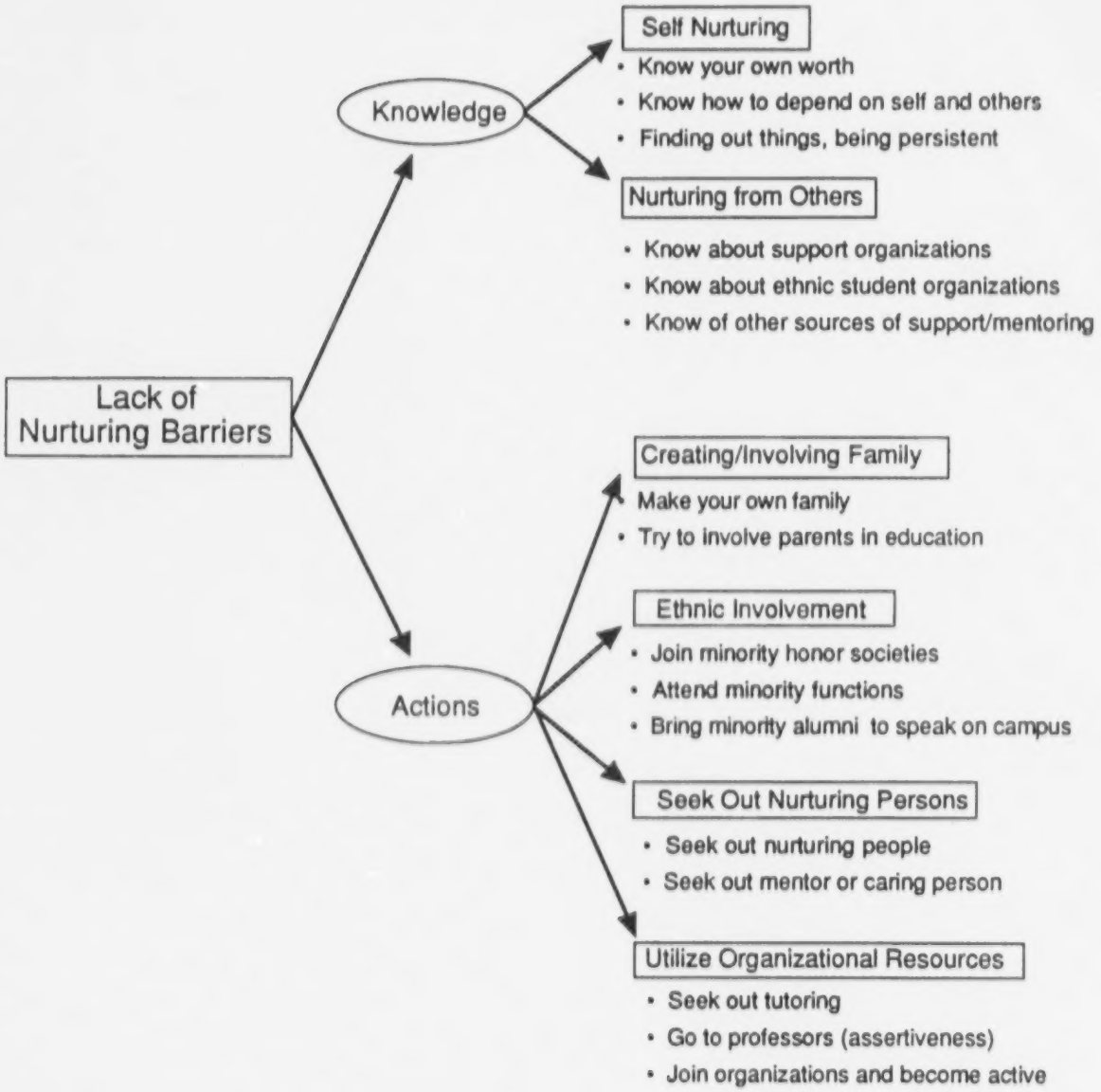
Lack of Nurturing Barriers
Knowledge
Actions
Self Nurturing
• Know your own worth
• Know how to depend on self and others
• Finding out things, being persistent
Nurturing from Others
• Know about support organizations
• Know about ethnic student organizations
• Know of other sources of support/mentoring
Creating/Involving Family
Make your own family
• Try to involve parents in education
Ethnic Involvement
• Join minority honor societies
• Attend minority functions
• Bring minority alumni to speak on campus
Seek Out Nurturing Persons
• Seek out nurturing people
• Seek out mentor or caring person
Utilize Organizational Resources
• Seek out tutoring
• Go to professors (assertiveness)
• Join organizations and become active

Figure 5. The knowledge and actions that successful students use to overcome lack of nurturing barriers from the perspective of minority students.

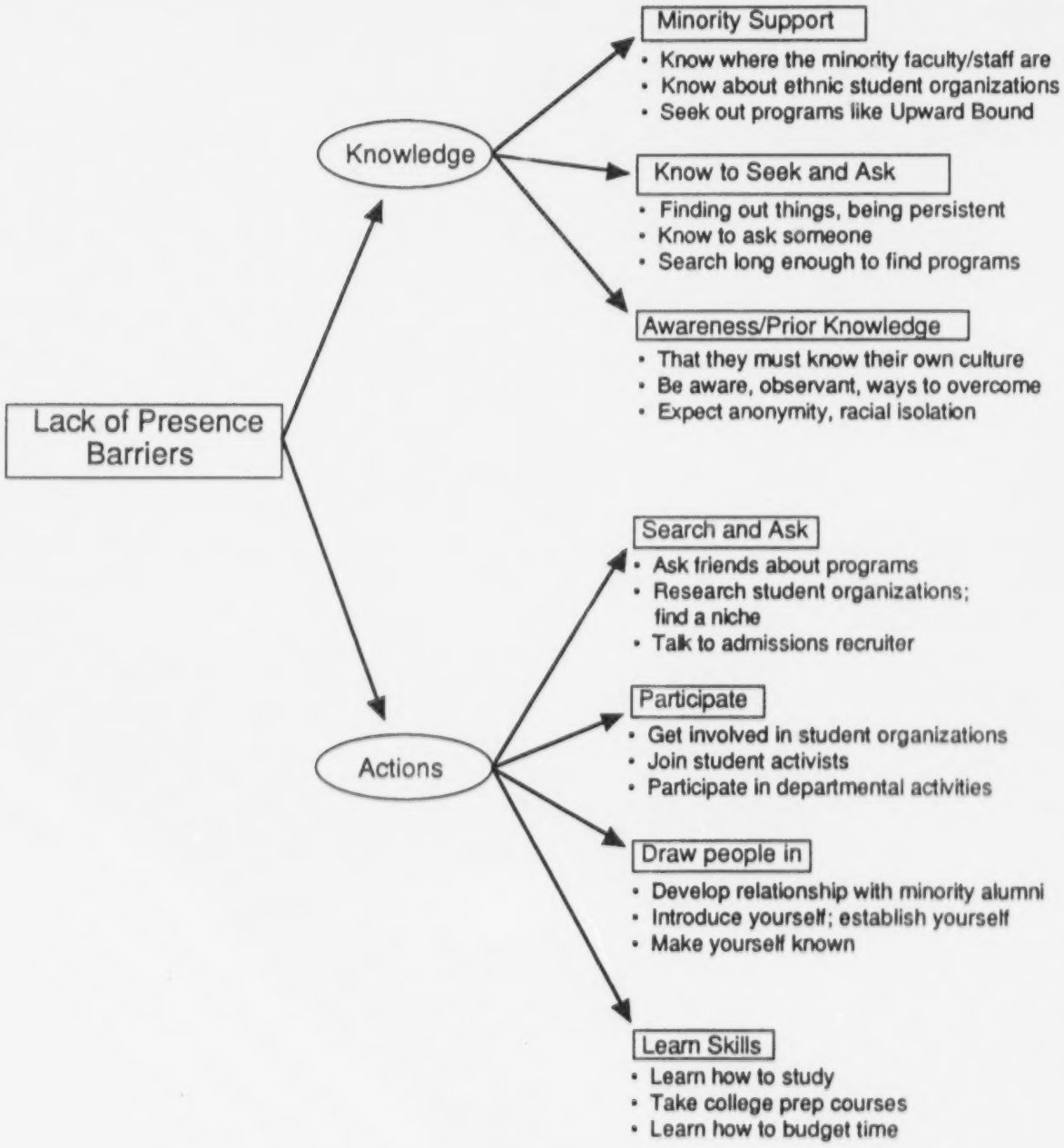
Lack of Presence Barriers
Knowledge
Actions
Minority Support
• Know where the minority faculty/staff are
• Know about ethnic student organizations
• Seek out programs like Upward Bound
Know to Seek and Ask
• Finding out things, being persistent
• Know to ask someone
• Search long enough to find programs
Awareness/Prior Knowledge
• That they must know their own culture
• Be aware, observant, ways to overcome
• Expect anonymity, racial isolation
Search and Ask
• Ask friends about programs
• Research student organizations; find a niche
• Talk to admissions recruiter
Participate
• Get involved in student organizations
• Join student activists
• Participate in departmental activities
Draw people in
• Develop relationship with minority alumni
• Introduce yourself; establish yourself
• Make yourself known
Learn Skills
• Learn how to study
• Take college prep courses
• Learn how to budget time

Figure 6. The knowledge and actions that successful students use to overcome lack of presence barriers from the perspective of minority students.

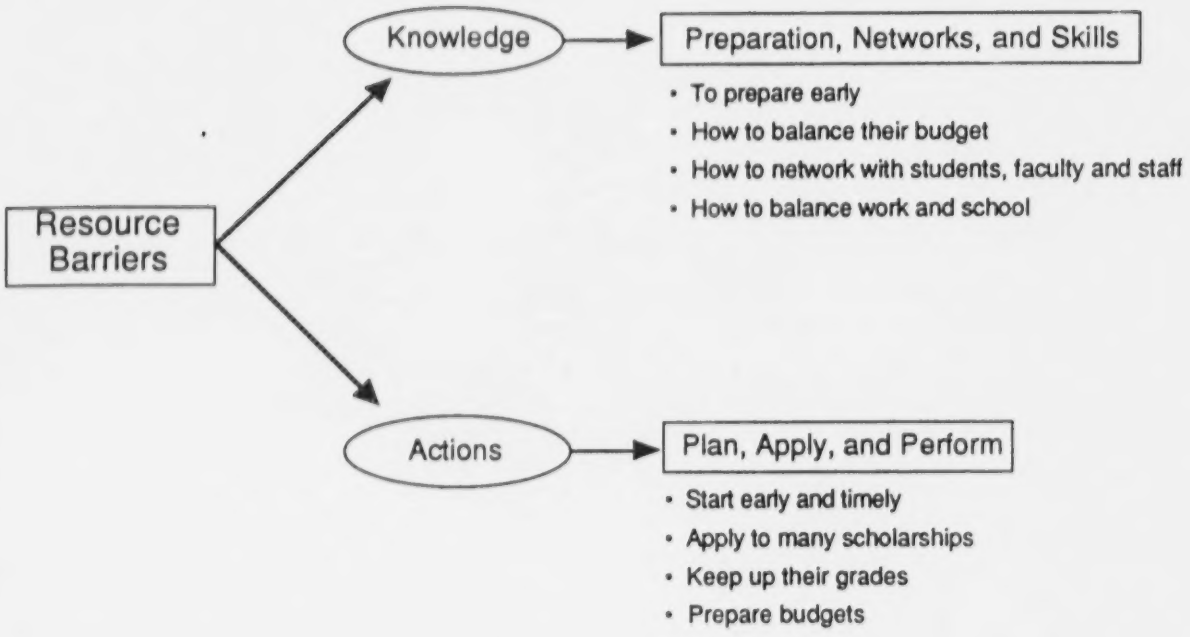
Knowledge
Preparation, Networks, and Skills
• To prepare early
• How to balance their budget
• How to network with students, faculty and staff
• How to balance work and school
Resource Barriers
Actions
Plan, Apply, and Perform
• Start early and timely
• Apply to many scholarships
• Keep up their grades
• Prepare budgets

Figure 7. The knowledge and actions that successful students use to overcome barriers related to resources from the perspective of minority students.

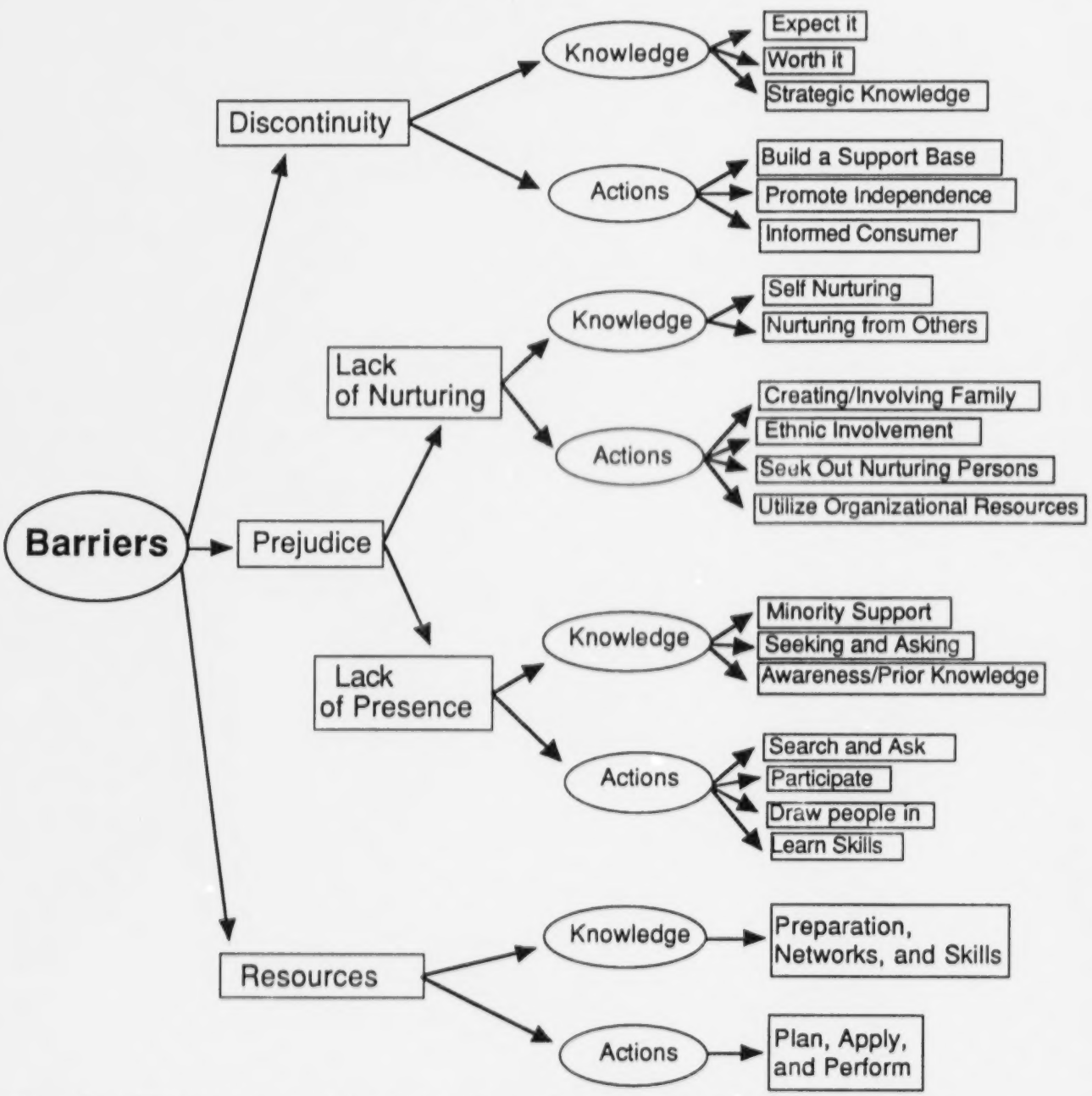

Figure 8. Local concept model of heuristic knowledge that successful students (those completing their degrees) possess at a large public university in the Southwest from the perspective of minority students.